What is claimed is:

1. An apparatus for charging and discharging a capacitive load to predetermined setpoints comprising:

a smart material actuator; and

a voltage controlled DC to DC converter for operating the smart material actuator in a proportional manner.

2. The apparatus of claim 1, wherein the voltage controlled DC to DC converter further comprises a self-oscillating drive circuit connected to a primary coil of a transformer with drive signals 180 degrees out of phase.

3. The apparatus of claim 2, wherein the voltage controlled DC to DC converter further comprises an auxiliary coil on the transformer.

4. The apparatus of claim 2, wherein the voltage controlled DC to DC converter further comprises a secondary coil on the transformer.

5. The apparatus of claim 4, wherein the voltage controlled DC to DC converter further comprises an attached diode rectifier to generate a DC voltage from an AC signal of the secondary coil on the transformer.

6. The apparatus of claim 2, wherein the voltage controlled DC to DC converter further comprises a voltage feedback network for voltage regulation.

7. The apparatus of claim 2, wherein the voltage controlled DC to DC converter further comprises 2 NPN transistors defining a push-pull transformer driver.

8. The apparatus of claim 2, wherein the voltage controlled DC to DC converter further comprises control circuitry for stopping and starting the self-oscillating mechanism.

9. The apparatus of claim 1, wherein the voltage controlled DC to DC converter further comprises a diode on an input stage for reverse polarity protection.

10. The apparatus of claim 1, wherein the converter further comprises both a bead inductor and a bypass capacitor for suppression of radiated EMI into a power source.

11. The apparatus of claim 1 further comprising a smart material drive circuit for actively charging and discharging the smart material actuator in response to connecting and disconnecting a power source respectively.

12. The apparatus of claim 1 further comprising a smart material drive circuit for actively controlling at least one of charging and discharging the smart material actuator in response to a control signal.

13. The apparatus of claim 2, wherein the transformer is of wound core design.

14. The apparatus of claim 2, wherein the transformer is of LTCC design.

15. An apparatus for charging and discharging a capacitor to predetermined setpoints comprising:

a smart material actuator;

a power source connectible to the smart material actuator; and

a switch circuit for actively discharging the smart material actuator in response to removal of the connection to the power source.

16. The apparatus of claim 15 further comprising the switch circuit for actively charging the smart material actuator in response to connecting the power source.

17. The apparatus of claim 15 further comprising the switch circuit for actively controlling charging and discharging the smart material actuator in response to a control signal input.

18. The apparatus of claim 15 further comprising the switch circuit for actively controlling at least one of charging and discharging the smart material actuator in response to a control signal.

19. The apparatus of claim 15, wherein the switch further comprises a voltage comparator and FET transistor to control a DC to DC converter.

20. The apparatus of claim 19, wherein the switch has three operational modes, charge load, hold load and discharge load.

21. The apparatus of claim 15, wherein the switch further comprises a voltage comparator and FET transistor to control an active discharge of the smart material actuator.

22. The apparatus of claim 21, wherein the switch has three operational modes, charge load, hold load and discharge load.

23. A method for charging and discharging a capacitor to predetermined setpoints comprising the steps of:

providing a smart material actuator; and

operating the smart material actuator in a proportional manner with a voltage controlled DC to DC converter.

24. The method of claim 23 further comprising the step of connecting a self-oscillating drive circuit to a primary coil of a transformer with drive signals 180 degrees out of phase.

25. The method of claim 24 further comprising the step of providing an auxiliary coil on the transformer.

26. The method of claim 24 further comprising the step of providing a secondary coil on the transformer.

27. The method of claim 26 further comprising the step of attaching a diode rectifier to generate a DC voltage from an AC signal of the secondary coil on the transformer.

28. The method of claim 24 further comprising the step of feeding back a voltage signal for voltage regulation.

29. The method of claim 24 further comprising the step of providing two NPN transistors defining a push-pull transformer driver.

30. The method of claim 24 further comprising the step of stopping and starting the self-oscillating mechanism with control circuitry.

31. The method of claim 23 further comprising the step of providing a diode on an input stage for reverse polarity protection.

32. The method of claim 23 further comprising the step of suppressing radiated EMI into a power source with both a bead inductor and bypass capacitor.

33. The method of claim 23 further comprising the step of actively charging and discharging the smart material actuator in response to connecting and disconnecting a power source respectively with a smart material drive circuit.

34. The method of claim 23 further comprising the step of actively controlling at least one of charging and discharging the smart material actuator in response to a control signal with a smart material drive circuit.

35. A method for charging and discharging a capacitor to predetermined setpoints comprising the steps of:

providing a smart material actuator;

connecting a power source to the smart material actuator; and

actively discharging the smart material actuator in response to removal of the connection to the power source with a switch circuit.

36. The method of claim 35 further comprising the step of actively charging the smart material actuator in response to connecting the power source with the switch circuit.

37. The method of claim 35 further comprising the step of actively controlling charging and discharging the smart material actuator in response to a control signal input with the switch circuit.

38. The method of claim 35 further comprising the step of actively controlling at least one of charging and discharging the smart material actuator in response to a control signal with the switch circuit.

39. The method of claim 35 further comprising the step of controlling a DC to DC converter with a voltage comparator and FET transistor.

40. The method of claim 39, wherein the switch has three operational modes, charge load, hold load and discharge load.

41. The method of claim 35 further comprising the step of controlling an active discharge of the smart material actuator with the switch.

42. The method of claim 41, wherein the switch has three operational modes, charge load, hold load and discharge load.